U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Coastal Protection and Restoration Division
c/o EPA Region X (ECL-117)
1200 Sixth Avenue
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October 20, 2006

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Dear Chip and Eric:

This letter provides **NOAA's comments on the Round 3 Lamprey Ammocoete Toxicity Testing Quality Assurance Project Plan Draft**. We appreciate LWG's efforts to produce this document, especially given the relative rapid turn-around times required by scheduling. The document, prepared by Windward Environmental LLC for the Lower Willamette Group, is dated October 13, 2006. Please let us know if you need clarification or if you have any questions or input regarding any of these comments.

General Comments

Activities described in this Quality Assurance Project Plan (QAPP) are generally commensurate with the objectives outlined in the Field Sampling Plan for lamprey ammocoete toxicity testing (Windward, 2006), including following a phased approach. The document includes all major elements of EPA's guidance for QAPP development (EPA, 2001 and 2002a), including project management, data generation and acquisition, assessment and oversight, and data validation and usability. The QAPP also acknowledges the importance of incorporating information gained from Phase I when protocols are to be developed for Phase II.

Similar to the Field Sampling Plan (FSP), a major concern is that the QAPP does not lay out the investigatory, protocol development approach outlined in the objectives. Since water-only exposures (with use of clean substrate for burrowing) have been agreed upon by stakeholders (vs. sediment bioassay), the response of the ammocoetes to such treatment without toxicants should be tested first, with reasonable metrics used to determine whether stress other than mortality occur. Unless ammocoetes survival and health in the water

column alone has been established in other studies, this preliminary test would be necessary to determine whether a water-only test is appropriate.

Overall, there is no discussion on Quality Assurance/Quality Control (QA/QC) for field activities, husbandry, or analytical work. Appropriate documents should at least be cited. There are also many important test parameters identified in the QAPP that have no specific requirements. Table 2-1 could be improved by expanding it to include methods where appropriate, consistent description of monitoring schedules, and performance criteria by which the test will be compared. Some issues noted in the work plan were not addressed in the QAPP, e.g., what water samples would be collected for confirmatory testing. Lastly, if corrective actions cannot be made in time and the tests fail (e.g., the unrealistic 90% control survival criterion is not met), what is the next step – will the laboratory be responsible for re-testing or will the entire collection/Phase I effort be repeated at a later date?

LWG proposes a static range finding approach followed by flow-through studies to determine LC50 values. NOAA notes that a better approach would be to conduct flow-through range finding tests prior to initiating the LC50 tests. Presumably, the ranges developed in the static tests could be used to refine the targets for the flow-through range-finding tests.

NOAA also notes that the QAPP proposes test conditions of 12 degrees +/- 1 degree C, though it is not entirely clear that 12 degrees is an optimal target temperature. It is also our understanding that LWG's consultants are in contact with various experts. We simply request that this issue be considered very carefully and that the target temperature be revised if new information suggests this to be a prudent course of action.

Specific Comments – Text

1. Page 5, Section 1.2: Goals and objectives (although perhaps elaborated on in the work plan) need to be clearly identified here, including stating the specific problem and what we need to know. For example, add to end of second sentence "…to assess potential risk to lamprey ammocoetes from Portland Harbor contamination" and add to second to last sentence "… with lamprey ammocoetes to determine acute toxicity (range of LC50s) or test sensitivity to chemicals of potential concern relative to other fish species."

2. Page 5, Section 1.2: The preferred tissue-residue approach is mentioned, but no explanation is provided about its relevance to this proposed toxicity testing.

3. Page 5, Section 1.3: Include project schedule (timeframe for analytical work for the Phases). Mention source of lamprey ammocoetes (e.g., collected from Siletz River) – may be worth citing the FSP (and perhaps a field QAPP) here for more detailed information.

4. Page 5, Section 1.4: Data Quality Objectives should be more definitive. Although citing Section 2.0 (Table 2-1 in particular) may be appropriate to reference test conditions and performance criteria, what is the ultimate goal of doing the bioassay test in the first place?

5. Page 6, Section 1.5: As indicated in Section 3.1.1, special training for conducting toxicity tests IS required. Citing the laboratory SOP (Appendix A) should be adequate.

6. Page 6, Section 1.6.1: The laboratory records should include much more narrative as well as detailed monitoring data (original and summary) of the husbandry phase of the study. More information should also be provided about what constitutes "normal" behavior and "good condition" of lamprey ammocoetes (e.g., how they behaved in the field upon collection) to compare to the results provided in the narrative.

7. Page 6, Section 1.6.1: It would be helpful to list the specific water quality measurements (e.g., DO, pH, etc.) in this section.

8. Page 7, Section 1.6.3: Please clarify that audits will be done on-site in the laboratory during testing (first bullet).

9. Page 9, Section 2.1: As in the Field Sampling Plan, the objectives listed for Phase I do not seem consistent with the QA/QC described in the QAPP; e.g., the text in the third bullet lists establishing the proper rate of flow-through, but the QA on the rate or rate determination are not discussed. Of particular importance is identifying the QA associated with the "primary goal" of good condition and successful maintenance, discussed in the third paragraph. Details are not provided for the first three objectives that involve establishing proper methods for holding, feeding, etc. (i.e., husbandry testing).

10. Pages 10-11, Table 2-1: This table should be expanded to include a column for "Acceptance Criteria" (how much excursion from the proposed conditions are allowed for the test to be considered valid) and a column for "Method" (instruments used) – basically, to summarize the parameters discussed in Appendix B. Similar tables should be included for the field collection (or cite the FSP) and for the husbandry portion. Other comments:
    - Temperature: [see general comment above]
    - Test chamber size: recommended minimum is 250 ml, but can the chamber size be estimated at this time based upon general knowledge of the range of ammocoete sizes?
    - Solution volume: recommended minimum is 200 ml, but can the solution volume be estimated based upon general knowledge of the range of ammocoete sizes?
    - Renewal of test solutions: no flow rate is mentioned for the definitive tests; no percent of volume replacement is stated.

- Organisms per test chamber: There is no mention of the size range of these organisms, which would influence the number per chamber; will they be measured upon collection and/or testing?
- Number of replicates: one number (e.g., "minimum of one") should be specified.
- Aeration and Dilution water: are these based on Siletz River conditions?
- Test concentration: one number (e.g., "minimum of 3") should be specified.
- Endpoint: partial mortality should be included for Phase II (based on Section 2.2); also note that non-lethal endpoints might require consideration.
- Test acceptability criterion: the acceptability criterion should be applied to the range-finding tests as well. Why is "control(s)" left ambiguous – i.e., how many will there be?
- Items that should also be detailed include: controls and all water quality parameters.

11. Page 11-12, Section 2.2: This section should include testing methods, handling and custody, and analytical methods. Please cite the relevant appendices (SOPs, testing protocols) and addenda (water chemistry) for specific methods. Because no method currently exists for holding and testing lamprey ammocoetes, method performance criteria should be included here (temperature change is the only parameter listed here). Other comments:
    - First bullet: Might be useful to include a positive control with a standard toxicant.
    - Fourth bullet: According to Appendix B, temperature will be measured only once daily; thus, a mean of multiple daily measurements does not apply. In addition, the maximum range should be stated, i.e., ± 3ºC.
    - Fifth bullet: "may vary slightly" needs to be quantified in a QAPP.
    - Last paragraph: The consequences of the failure to achieve partial mortality should be stated, i.e., no LC50 will be obtained.
    - Section 3.1.2 should be cited for corrective actions.

12. Page 12, Section 2.3: The "standard" QA/QC procedures applicable to these tests should be referenced. In Table 2-1 or elsewhere the proposed ranges for the listed water quality parameters should be stated.

13. Page 12, Section 2.5: Are there minimum criteria used to determine "satisfactory"? Please refer to the SOP.

14. Page 14, Section 3.1.2: What are "appropriate corrective actions"? (Examples would be helpful.)

15. Pages 15-16, Section 4: The discussion in this section highlights the lack of specific QA criteria against which to judge the collection, husbandry, and testing. Please

provide more specific DQOs, as noted in Section 4.3, that can be used for this assessment.

16. Page 15, Section 4.2, Third bullet: This task should also include reviewing the data from at least the husbandry portion of the effort.

Specific Comments – Appendix B

1. Page 2, Section 4: How will municipal water be dechlorinated?

2. Page 2, Section 5.1: This section indicates that the species will not be identified, although Section 1.2 identifies *Lampetra tridentate* as the species of interest. It should be clarified that *Lampetra tridentate* is the species of interest but that it is not practicable to differentiate between four species of lamprey present while in the ammocoete life phase. Hence, the assessment will be focused at the genus level, *Lampetra* sp.

3. Page 3, Section 7.2: The effects criterion is mortality, but other sub-lethal effects should at least be noted during testing, such as swimming, burrowing, avoidance, or other behavior responses; weight change, respiration rate, etc. (morbidity may also be discussed in the summary Table 2-1), particularly considering the experimental nature of this bioassay test.

4. Page 4, Table: Number of water samples to be collected for confirmatory testing, volumes required, and sampling schedule during testing should be provided (or cite the upcoming document that will describe water chemistry analytical procedures and QA/QC needs, and tissue residue analyses, if done as well).

5. Page 4, Section 7.7, last paragraph: State that the stock solution being tested will be maintained under the exact same conditions as the testing solution.

NOAA appreciates the opportunity to provide these comments. Please let me know if you have any questions.

Sincerely,

Robert Neely
NOAA Coastal Resource Coordinator

cc: Alyce Fritz, NOAA / NOS / ARD (by email)
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References

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